LESSON 2: INTEGRATION BY PARTS

Objective:	To introduce and apply integration by parts

Integration by Parts

$$\int udv = uv - \int vdu$$

Procedure:

1. Let u equal part of the integrand and dv be the remainder of the integrand (ILATE)
2. Compute du with the derivative
3. Compute v with integration
4. Substitute into $uv - \int vdu$

Tabular Method

Useful for forms $\int x^n \sin axdx$, $\int x^n \cos axdx$, or $\int x^n e^{ax} dx$

Examples

1. $\int x\cos xdx$
2. $\int x^2 e^x dx$
3. $\int e^x \cos 3xdx$
4. $\int x^3 e^{x^2} dx$
5. $\int \ln xdx$

Problems

1. $\int x^2 \cos 2xdx$
2. $\int x^4 \ln xdx$
3. $\int x^3 e^{5x} dx$
4. $\int (\ln x)^2 dx$
5. $\int \cos^{-1} xdx$